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"Flying is Changing Women!": Women Popularizers of Commercial Aviation and the Renegotiation of Traditional Gender and Technological Boundaries in the 1920s-30s

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“FLYING IS CHANGING WOMEN!”: WOMEN POPULARIZERS OF COMMERCIAL AVIATION AND THE RENEGOTIATION OF TRADITIONAL GENDER AND TECHNOLOGICAL BOUNDARIES IN THE 1920s-30s

A Thesis Presented

by

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DEDICATION

To James: for your encouragement and support.
To my own little Amelia: for keeping my lap warm during late nights spent typing.

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ABSTRACT

"FLYING IS CHANGING WOMEN!": WOMEN POPULARIZERS OF COMMERCIAL AVIATION IN AND THE RENEGOTIATION OF TRADITIONAL GENDER AND TECHNOLOGICAL BOUNDARIES IN THE 1920s-30s

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This thesis explores how the complex interplay between gender and technology significantly shaped the popularization of commercial aviation in the United States during the 1920s and 30s. As technological innovations improved both the safety and efficiency of airplanes during the early part of the twentieth century, commercial aviation industries increasingly worked to position flight as a viable means of mass transportation. In order to win the trust and money of potential passengers, however, industry proponents recognized the need to separate flight from its initial association with danger and masculine strength by convincing the general public of aviation's safety and reliability. My work examines the efforts made by industry executives, pilots, and popular news sources to remake the public image of flight by specifically positioning women—as pilots, wives, and mothers—as central to the popularization of commercial aviation. More specifically, this thesis investigates the ways in which female popularizers of commercial aviation effectively mediated the boundaries between technologies and society, and how women's positions as technological boundary workers often required them to redefine the social meanings and expectations of their gender.

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INTRODUCTION

MASCULINE NORMALITY/ FEMALE EXCEPTIONALISM: USING FEMINIST METHODOLOGIES TO RE-WRITE THE HISTORY OF AVIATION

"Congratulations, sir, that was your pilot," an airline associate proclaims while gesturing toward a nearby woman neatly clad in customary navy pilot's garb. The befuddled customer places his hand over his mouth and questions, "My *pilot?* That *girl?*," then releases the wild, guttural laughter he was painfully struggling to suppress. Falling prey to the hidden cameras and zany antics of an early 1960s episode of Candid Camera, this "average" airline customer unwittingly became a symbol of societal anxieties over women and technology. Introducing the "woman pilot sketch," the Candid Camera host explains, "We are trying very hard these days to give women equality in all job opportunities… its no longer a surprise to see a lady turn up for almost any kind of work."[1] After viewing the shock and dismay written on the faces of the featured airline customers, it becomes clear that the "*almost*" clearly indicates that women have made few inroads into the aviation profession. While job opportunities for women in the 1960s remained largely unequal to those of men's (despite the host's patronizing assurance), understanding the limited place for women pilots in commercial aviation requires looking beyond work-place discrimination, and deeper into the ways popular understandings of technology and gender have changed throughout history. Viewed through efforts to popularize commercial aviation in the 1920s and 30s, gender emerges as a driving force in determining the nature of sociotechnological change. Examining gender's role in

[1] www.youtube.com (The video clip has since been taken off of the Youtube website, so I am unable to provide a URL. Subsequent attempts to contact Candid Camera for specific citation information have proved unsuccessful).

shaping the sociotechnological change of flight will lead to a more nuanced understanding of the interplay between gender and technology. Such an analysis will specifically recast the history of aviation by deconstructing the tendency within the field to understand technology as a masculine normality, which in turn necessitates the association of femininity and technology as the product of exceptional forces.

Imagining an alternative Candid Camera episode in which a woman pilot does not serve as the punch line begins with a backward look to a period when the idea of a female pilot elicited a considerably different public response—a period when critical changes in the nascent technology of aviation opened up a flexible space within which women could claim greater authority. As technological innovations improved both the safety and efficiency of airplanes during the early part of the twentieth century, commercial aviation industries increasingly worked to position flight as a viable means of mass transportation. Public spectacles such as Charles Lindbergh's harrowing, but successful, 33 hour and 30 minute trans-Atlantic flight on May 20, 1927 from Roosevelt Field in New York to Le Bourget in Paris drew attention to aviation's developments.[2] After becoming the first person to fly solo over the Atlantic, Lindbergh was immediately lionized, propelling him to the level of American hero. As a result of his celebrity status, the eye of the public became fixed securely on the burgeoning field of aviation. In the midst of the massive public response to Lindbergh's flight, Lindbergh himself persistently emphasized the aeronautical development and technological accomplishment demonstrated by his flight. As a result, Lindbergh became the symbol of American technological progress that

[2] John W. Ward, "The Meaning of Lindbergh's Flight," *American Quarterly*, Vol.10, No. 1, (Spring, 1958), 3.

highlighted much of the decade.[3] As John Ward argues, "Modern America was the creation of modern industry," and nothing represented the success of American industry and technological ingenuity more than Lindbergh's hop over the Atlantic.

While not completely disabusing flight of its heroic, male-dominated image, Lindbergh's flight nonetheless cast a public spotlight on the essential developments within aviation that had been steadily taking shape during the Twenties. As is the case with many American technological innovations, after being bolstered and financed within the military, aviation too made its journey into the civilian realm. Since its conception, aviation had been largely controlled by the military. During the 1920s, however, fueled by a post-war surplus of airplanes, aviation experienced a major growth in the private sector. The relatively small production of civilian aircraft in 1920—a mere 75 planes—skyrocketed to 342 planes by 1925.[4] As a result, the industry as a whole boomed, with the number of aircraft, civilian and military, more than doubling from 1920 to 1925.[5]

A series of legislative policies lent to the growing stability of the aviation industry. In his book *Climb to Greatness*, John Rae explains that the "first step in the development of a comprehensive national policy for aviation" came in 1925 with the Kelly Air Mail Act (KAMA). The act transferred the operation of airmail lines from the US Postal Office to the private sector.[6] The KAMA greatly stimulated the aviation market by opening up the potential for competition within the private sphere. As private businesses began to compete for airmail contracts, new technologies were developed that

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[3] Ward, 13.
[4] John B. Rae, *Climb to Greatness: The American Aircraft Industry, 1920-1960*, (Mass.: MIT Press, 1968), 18.
[5] *Ibid.*, 18.
[6] *Ibid.*, 22.

lowered costs. In response to the growth of the industry under the KAMA, the government faced the challenge of regulating the emerging field. In 1926, the government responded with the Air Commerce Act, which established the Bureau of Air Commerce as a branch of the Department of Commerce. The newly formed bureau had the authority to "establish safety regulations, provide for airways and navigational aids, encourage the building of airports, and regulate civilian aviation generally."[7]

The federal government also increased expenditures on aviation from six million in 1922 to 12 million in 1926.[8] The large funding increase coupled with a newly formed coherent aviation policy set the foundation for growth and, as a result, civilian aviation flourished during the latter half of the decade. In 1926, civil aircraft production surpassed military production for the first time and began to rapidly increase, climbing from 654 planes produced in 1926 to an impressive 5,516 planes produced in 1929.[9] This major jump in production was due in large part to technological advancements that increased aeronautical efficiency and safety, while also lowering production costs. A combination of several changes gave birth to the modern plane design of the Twenties. In 1924 the radial air-cooled engine was introduced along with better aviation fuels. Externally, the use of all-metal monocoque airframes built of aluminum alloy and smooth-stressed skins created an exoskeleton capable of providing more structural support. In addition, aerodynamic enhancements including the introduction of the

[7] *Ibid.*,, 23.
[8] *Ibid.*, 23.
[9] *Ibid.*, 18.

controllable-pitch propeller as well as retractable landing gear resulted in airplanes with greater lift and less drag—overall making planes safer, more efficient, and cheaper.[10]

As flight emerged from these formative years an increasingly reliable and efficient means of transportation, prospects for a commercial aviation industry flourished. Eager commercial aviation proponents soon discovered, however, that assurances of radial air-cooled engines and controllable-pitch propellers served as cool comforts to nervous passengers imagining the dangerous stunt flying of early "barnstormers." As danger and heroics pervaded early characterizations of flight and pilots, building a successful aviation industry first required an image overhaul in the mind of the public. In order to dissociate flight from its initial image of danger and risk, industry proponents recognized the need to popularize aviation, yet faced a crucial challenge: How could aviation, which had previously been presented as a daring feat of masculine strength, be sold as a safe and reliable mode of transportation to the general public? In response, popular science journals, the National Education Association, industry executives, and pilots themselves engaged in a collective effort to popularize aviation not only by touting its convenience but also by communicating the science of flight to a broad audience. Women as wives, mothers, and pilots—as both users and consumers of the technology of flight—became central to such efforts to popularize commercial flight.[11] An analysis of women as popularizers of aviation in the 1920s and 30s reveals that gender played a primary role in aviation's integration within society.

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[10] *Ibid.*, 58.

[11] Joseph Corn, "Making Flying 'Thinkable:' Women Pilots and the Selling of Aviation, 1927-1940," *American Quarterly* 31 (1979).

By positioning the interplay between gender and technology as central to the rise of commercial aviation, this thesis makes use of a feminist framework to examine the history of technological change. The works of such pioneers of the field as Ruth Schwartz Cowan and Judith McGaw emphasize the importance of gender as a category of historical analysis. As one scholar summarizes McGaw's approach, "Gender, as a socially constructed system based on hierarchies of power, must be analyzed to reveal the ways in which *both* men and women are assigned what are considered appropriate roles in the process of technological change."[12] Drawing on McGaw's work, my research examines how gender and the technology of flight interacted in the late 1920s and early 30s to shape notions of gender as well as specific uses of aircraft.

Feminist analyses of the history of technology, science, and gender have also made an important historiographical contribution, from which my work takes its lead. As Angela Creager explains in the introduction to her essential volume of essays which synthesizes work on the history of science, technology, and medicine: "The extensive and rich literature on these issues [feminist histories of science, technology, and medicine] has been implicitly organized around a critical program…that feminism can provide a qualitatively better lens through which to view historical processes." However, Creager identifies a pitfall within this body of literature which her work attempts to correct, explaining that "this critical program has been somewhat fragmented, with the large body of scholarship on gender and science isolated from that on gender and technology…"[13]

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[12] Pursell, Carroll, "Feminism and the Rethinking of the History of Technology," in *Feminism In Twentieth-Century Science, Technology, and Medicine* ed. Angela Creager, (Chicago: University of Chicago Press, 2001), 116.
[13] *Ibid.*

Following Creager's corrective, my work examines efforts to popularize both the technology as well as the science of flight and the gendered implications of both.

In viewing the history of aviation's commercialization through a feminist lens, my work departs from previous accounts of aviation's development as well as historical treatments of women and flight more specifically. As Lerman, Mohan, and Oldenziel point out in their landmark historiographical analysis of gender and technology studies,[14] early scholarship within the field generally focused on re-writing the "*his*-story" of technology by emphasizing the pioneering accomplishments of a select group of extraordinary women.[15] The majority of existing scholarship examines women's involvement in flight in terms of their exceptionalism—such is the case in examinations of the Women's Airforce Service Pilots as well as early Stewardesses. In order to correct this trend within the study of gender and technology, the authors explain, "It is impossible to understand gender without technology as to understand technology without gender…[therefore] future research must attend to masculinity as well as femininity, instead of assuming male normality and female exceptionalism.[16] Kathleen Barry's recent book, *Femininity in Flight: A History of Flight Attendants*, makes a critical move away from this trend in positioning early stewardesses as central to the rise of commercial aviation. Barry claims, "Stewardesses entered the popular cultural

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[14] Nina Lerman, Arwen Palmer Mohun, Ruth Oldenziel, "The Shoulders We Stand on and the View from Here: Historiography and Directions for Research," *Technology and Culture* 38 (1997), 9-30.
[15] Berner, Boel, trans., *Gendered Practices: Feminist Studies of Technology and Society*, Stockholm: Almqvist & Wiskell International, 1997.
[16] *Ibid.*, 30.

imagination as female 'pioneers' of the modern frontier of flight."[17] While Barry works to integrate stewardesses within the broader history of flight, in focusing on flight attendants as the main means used by the commercial aviation industry to sell tickets, she fails to examine the role women played as technological actors to encourage flight—making use of their technological prowess as pilots rather than their domesticating skills as hostesses. The focus of Barry's work lies in an analysis of the labor organizing of flight attendants and, thus, does not primarily address the relationship between gender and technology in a theoretical sense. Regardless, in leaving women pilots out of the story, Barry fails to see the popularization of commercial aviation as a moment that opened up the potential for the redefinition of both gender and technological authority.

Like Barry, I am interested in reintegrating the experience of women pilots within the broader historical narrative of flight—a narrative premised on male normality, which too often relies on the great heroes or inventors of flight. That is not to say that the contributions made by well-known pilots like Amelia Earhart and Charles Lindbergh should be minimized. Rather, I am arguing that a whole host of women—pilots and non-pilots alike—played an equally important role in popularizing aviation. An analysis of their involvement affords a valuable opportunity to study the gendered nature of aviation's sociotechnological development as well as to offer potential explanations for the historically limited place for women within aviation.

The fact that during the 1920s and 30s industry executives often invoked women to "sell" aviation to the public is not a new idea to the field of aeronautical history. In his groundbreaking examination of America's so-called "Romance with Aviation," titled *The*

[17] Kathleen Berry, *Femininity in Flight: A History of Flight Attendants*, Duke University Press, 2007.

Winged Gospel, Joseph Corn brings to light women pilots' involvement in promoting aviation. Corn writes, "Throughout the late 1920s and 1930s, numbering at most about 500 and constituting less than one-thirtieth of all aviators, women pilots were highly visible in aeronautics and played an important role in spreading the winged gospel."[18] Corn's innovative take on the popularization of aviation and his careful reading of primary documents provides an invaluable foundation upon which to base my work. Corn, however, focuses on women as a small part of a larger look at aviation in American culture during the period. My research differs in that I am applying a distinctive theoretical framework to a similar set of questions. Not only does my work expand on Corn's evaluation of female pilots' efforts to popularize aviation, but it also examines the contributions made by women as consumers of the technology of aviation. In addition, drawing theoretical direction from the field of gender and technology studies, my work aims at understanding what these women can tell us about the ways in which gender ideologies and technological use can, and historically do, shape one another.

While Joseph Corn acknowledges the significance of the modestly sized group of female pilots during the period, Susan Ware focuses primarily on Amelia Earhart in her examination of women and aviation. In *Still Missing: Amelia Earhart and the Search for Modern Feminism*, Ware examines the life of Earhart as a vehicle through which to give a top-down assessment of the waning feminist movement in the post-suffrage era. In examining Earhart's connection to the feminist movement, Ware offers an astute assessment of the contributions as well as pit-falls of liberal feminism as it emerged during the period. Understanding the context of liberal feminism will put into

[18] Corn, 72

perspective the views of equality that the women pilots I examine often espoused. In addition, examining the limitations of liberal feminism poses crucial questions about the intersection of class and femininity in the early 20th century—a topic to which I will turn in a later chapter.

Ware's summations about women and aviation, however, prove inadequate as she generalizes her claims about female aviators based on Earhart's specific experience. For example, Ware explains "The late 1920s and 1930s represented a golden age for the woman pilot. But at the end of the decade women pilots had been excluded from the next stage of development—that of commercial aviation—and their marginalization was cemented by World War II."[19] My work, however, counters Ware's claim in framing women pilots as central to laying the groundwork that made commercial aviation possible. Despite this key difference in our analyses, Ware correctly points out that the increasing militarization of flight does eventually limit women's possibilities professionally within the field.

Before military training became the quickest, most affordable means of obtaining flying experience, the so-called "golden age of aviation" presented seemingly endless opportunities. Before the technological script of aviation had been written, women found great opportunities to influence the development of both the construction and use of aircraft. In chapter one, I explore this process in examining the co-construction of gender and aviation during the 1920s and 1930s. In chapter two, I add to a trend in technological studies that focuses on consumers in technological change by examining the role that women played as consumer's of the technology of flight. And in chapter three, I focus on

[19] Ware, 61-62

the women themselves involved in championing commercial aviation. In an examination of the Ninety-Nines, an all-women pilots' society, I attempt to answer questions about the personal backgrounds as well as socio-economic status of women pilots during the period. Finally, in the Epilogue, I address what came next for women in flight after the 1920s and 1930s. In my conclusion, I propose that an analysis of the dynamic forces shaping gender and technology during the period of aviation's development offers a key insight to understanding women in flight's historic marginalization—as well as provides a starting point for re-framing the relationship between gender and technology in current policy decisions and educational efforts.

CHAPTER 1

"FREEDOM IN THE SKIES": WOMEN PILOTS AND THE CO-CONSTRUCTION OF GENDER AND TECHNOLOGY

The claim that gender is central to the popularization of aviation and, thus, sociotechnological change more generally, rests on the acknowledgment that both gender and technology are socially constructed.[20] The scientific orthodoxy that emerged in the 17th century gave new credence to principles that crystallized naturalized sex distinctions—placing men in the realm of the rational and women in the sphere of the emotional.[21] Such "scientific" ideas at play in constructing gender ideologies are coded into various technologies in complex ways.[22] It is this social context that constructed aviation as a "masculine," rational technology associated with demonstrations of physical strength. A 1908 *Collier's* article titled "The Bird-Men" highlights the degree to which popular perceptions of aviation reinforced the daring, masculine image of flight. The article describes the "inhuman specters with wings and blades, which race in wind and cloud."[23] Clearly showing a penchant for the dramatic, in describing a record-breaking pilot the article proclaims: "the daredevil of them all! He rode the storm. In that…epoch-making flight… through wind and rain, amid lightening flashes and muttering thunder."[24] In addition to describing the heroism of flight by emphasizing the masculine strength of such pilots, the article goes on to declare their animalistic qualities

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[20] Mary Frank Fox, ed., *Women, Gender, and Technology*, Urbana: University of Illinois Press, 2006, 2-3.
[21] Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution*, New York: Harper Collins Publishers, 1980.
[22] Fox, 2-3.
[23] Shaw Thompson, "The Bird-Men," *Collier's* 44 (Sep., 1909), 20.
[24] Shaw, 21.

by describing the male pilots as "dreamy and taciturn, he is alert and chattering…An eagle man…with the curious birdlike deflection of the head, as though used for picking up seeds—which is characteristic of the type."[25] While such characterizations can be read as creative literary devices designed to entertain readers, placed within the context of contemporary scientific discourse, popular descriptions of pilots as inhuman and bird-like obtained new meanings. As Joseph Corn explains in his essay "Making Flying Thinkable," one medical doctor cited Darwin's theory of evolution to make a case for the genetic superiority of pilots, explaining that pilots "descended from birds whereas the vast majority of humankind descended from fish and would never be able to fly."[26]

Scientific expertise and popular understandings worked together to fashion a social understanding of flight premised on two things: flight could only be mastered by the most daring and physically fit of the general population, and women, in particular, were antithetical to the highly specialized technology of flight. Firmly rooted notions of biological differences between men and women also both initiated and shaped criticisms of women aviators. Voicing societal anxieties about women and technology, one critic declared, "Women don't like to mess around machinery and won't give the motors and controls the meticulous attention these vital parts of an airplane demand."[27] Rather, as he explains, "women are by nature impulsive and scatter brained. Therefore, they won't watch the instrument board, which tells the pilots the condition of his motor and the relative position of his airplane… [And] they don't watch the wind as it shifts around the

[25]Shaw, 20.
[26] Joseph Corn, "Making Flying Thinkable," *American Quarterly* 31 (1979), 559.
[27] Bruce Gould, "Milady Takes the Air," *The North American Review* 228 (Dec., 1929).

compass…"[28] Another critic calling for women pilots to be "grounded" claimed, "Women are lacking in certain qualities that men possess… Handling details essential to safe flying is one of the qualifications women have not mastered successfully."[29] While these critics questioned women's ability to successfully master the technology of flight, others argued that women would also fail to understand the science behind flight. Observing a lesson during an aeronautical ground course for women held at Cornell Medical College, one reporter for *The New Yorker* illustrated common prejudices against women in science. Poking fun at women pilots attempting to understand the complexities of meteorological patterns, the reporter cites an "attractive member of the class" as asking, "It's all pretty theoretical isn't it?"[30] While implying the woman's lack of ability to understand scientific theories, his emphasis on the pilot's appearance clearly marks his reluctance to take her seriously as a pilot rather than sexual object. The article closed by deeming women's shaky science comprehension as leaving the "future of women in aviation pretty much up in the air."[31]

Critics such as these, however, were largely drowned out in popular media by the aviation industry's persistent championing of women pilots. Through publicizing women pilots in a wide array of media outlets, industrial interests marketed the viability of commercial flight. The increased attention given to these women had an additional—and likely unintended—consequence. The frequent presence of photographs and articles devoted to female pilots in popular national journals and local newspapers alike forcefully thrust the relationship between gender and technology into the realm of public

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[28] *Ibid.*
[29] "Call of Derby, Tulsan Urges"
[30] "Ground Course," *The New Yorker* October 26, 1940.
[31] *Ibid.*

scrutiny. The commercialization of aviation opened up a popular discourse focused on negotiating the boundaries between gender prescriptions and acceptable technological uses. Never before had the casual newspaper reader flipping through the local paper over breakfast been encouraged, in such an overt way, to interrogate the possible implications of women flying airplanes—on both women in general as well as the aviation industry as a whole. Out of this renegotiation emerged new gender ideologies as well as new ways to imagine the airplane and its use in society.

Discussions of women and flight explored the implications of women as both users and operators of the technology of flight. As passengers and pilots women were seen as changing the appearance, construction, and use of the airplane. Investigating the status of women and aviation in their annual "Aircraft Year Book," the Aeronautical Chamber of Commerce declared, "The hand that rocked the cradle flies the family's plane today."[32] The report chronicled the rapid increase in women pilots—quadrupling between 1929 and 1931. As a result of this dramatic rise, the report argued that women's presence within the field had influenced the construction of the airplane. Looking to the model of sociotechnological change presented by the automobile, the report claimed, "Just as women were an important force in hastening the motor car out of the linen-duster stage, so they have influenced the building of luxury and comfort into the 1931 model planes."[33]

In addition to concerns of "luxury and comfort," recent studies have begun to explore the ways in which women pilots have necessitated basic changes in airplane design, specifically within the cockpit. For example, Rachel Weber's article

[32] Aircraft Year Book, 225.
[33] *Ibid.*

"Manufacturing Gender in Commercial and Military Cockpit Design" demonstrates the ways in which the constructions of both military and commercial cockpits present a specific bias against women.[34] Since commercial companies base their aircraft designs on models created by the military, Weber primarily focuses on the process by which the military determines its aircraft construction. In examining military cockpit specifications, Weber finds "Navy and Air Force engineers determined the five critical anthropometry design 'drivers' to be sitting height, functional arm reach, leg length, buttock-knee length, and weight."[35] Taking into account these spatial considerations, engineers constructed a cockpit designed to accommodate the 5th through 95th percentile of male body frames. As a result, however, the military-designed cockpits that were based primarily on male body dimensions only accommodated the 65th through 95th percentile of female frames—a small fraction of the female population compared to the male.[36] Certainly a far cry from discussions about women's affects on airplane design in 1931, Weber explains that not until 1993 did the military face enough pressure to alter cockpit dimensions. According to Weber in May 1993 the Under Secretary of Defense ordered the construction of military cockpits to accommodate at least 80 percent of women eligible to fly in the military.[37] While evaluations of women as pilots in 1931 did not center on such sophisticated measurement analyses, these early conversations about the ways in which women would affect airplane design undoubtedly served as a starting point for the changes which eventually came to fruition in 1993.

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[34] Rachel Weber, "Manufacturing Gender in Commercial and Military Cockpit Design," *Science, Technology, & Human Values* 22 (Spring, 1997): 235-253.
[35] Weber, 239.
[36] Weber, 239.
[37] *Ibid.*, 242.

Rather than concerning itself with cockpit construction, the 1931 Aeronautical Chamber of Commerce report examined the changing nature of aviation sales (sport planes in particular). The report highlighted the advent of an important new feature in airplane design: Color. While a seemingly peripheral factor from the standpoint of the airplane's structural integrity, the advent of new color combinations nonetheless represented a significant change in the physical compositions of aircraft. The report explained, "Color, which commands a place in the modern home from refrigerator to alarm clock, is taking an increasingly important place in aviation"—a factor directly attributable to the involvement of women.[38] Evidencing the changing appearance of the airplane and further cementing its association with the "modern," the report cited numerous examples of women who demanded that their planes be outfitted in the most novel color combinations. For example, When E.A. Samarrow, "Canada's first woman pilot," arrived in New York to order a plane she reportedly asked for "one with silver wings, yellow struts, blue fuselage, black top decking and a yellow stripe."[39] The report also detailed examples of women commanding hues ranging from "robin's egg blue" to "cream and purple."[40] Women pilots thus became central to transforming the airplane into a modern commodity capable of asserting its owner's personal identity.

In addition to improving the appearance of airplanes, women were envisioned as central to making the process of flying more comfortable. In order to accomplish such a feat, characterizations of aircraft like one from 1908 that likened planes to "great birds of

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[38] *Ibid*. 226. For an analysis of color and the marketing of consumer goods as "modern" during the period see Roland Marchand's *Advertising the American Dream*.
[39] Aircraft Year Book, 227.
[40] *Ibid.*

metal and canvas," had to be rewritten.[41] As a result, women and their planes were described variously as "Ladybirds" with their "Flying Boudoirs."[42] Referencing the airplane of two record-breaking pilots, one article related, "The Flying Boudoir is all very well in its way—a roomy thrush cabin plane…"[43] Also recognizing the profitability of associating women and aviation with comfort, commercial airlines recognized the need to rely on women's supposed innate sense of comfort and design in the creation of "well-furnished transport liners."[44] The Aeronautical Chamber of Commerce's report detailed that "airlines have learned that when they use a woman's judgment as the yardstick for decorating and furnishing their planes and passenger terminals, they not only attract other women passengers but overcome wives' and sisters' objections to husbands' and brothers' flying."[45] Echoing the report's position, Amelia Earhart underscored the important feminine stamp placed on aviation by women in pointing to the recent advent of attractive dining rooms at airports. Earhart declared, "I am sure many of the amenities one meets on the best airlines are the result of women's demands. The same thing is true of airports."[46]

Confirming the importance of catering to women in building the commercial airline industry, the report cited a survey of air transport lines, which claimed: "A large percent of the passengers flying the regular air lines are women." The survey indicated that in 1930, women constituted 43 percent of Pan American Airways passengers, 35

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[41] *Collier's*, 20.
[42] "Ladybirds Down with Powdered Noses and a Brand-New Record," *Literary Digest* 114 (Sept., 1932).
[43] Aircraft Year Book, 227.
[44] *Ibid.*
[45] *Ibid.* 225-226.
[46] Amelia Earhart, "Women's Influence on Aviation," *The Sportsman Pilot* 3 (Apr., 1930), 4.

percent of Boeing passengers, 30 percent of Colonial Air Transport passengers, and 20 percent of Transcontinental and Western Air's passengers.[47] In the eyes of industry executives, the relatively high numbers of women traveling on commercial airlines represented a substantial consumer block whose wants and desires should not be ignored. In addition to envisioning women themselves as potential paying customers, air transport companies also viewed them as key to securing male customers. After all, as the report argued, women who remained unconvinced of the safety and comfort of commercial flight represented a potential obstacle to attracting husbands and brothers to lend their patronage to airline transport.

Commercial airline companies and women pilots alike emphasized the changes women necessitated within the burgeoning aviation industry. In changing the appearance and construction of both airplanes and airports, women made a widely acknowledged mark on the development of commercial aviation. As women pilots shaped the technology of flight, however, so too did aviation in turn redefine boundaries of gender ideologies, further evidencing the "co-creation" of gender and technology. As Deborah Johnson argues in the introduction to
Women, Gender, and Technology, since "technology is socially shaped; gender patterns in society can therefore be reproduced in constituting technology." At the same time, Johnson explains, "technology shapes society: if gender has been coded into a technology, that technology may reinforce gender patterns."[48] While some pilots

[47] Aircraft Year Book, 226. The survey specifically examines the Pan American Airways line between Miami, Havana, and Nassau; the Boeing "special night plane" from San Francisco to Salt Lake; and, the Colonial Air Transport's line from New York to Boston.
[48] Mary Frank Fox, ed., *Women, Gender, and Technology*, Urbana: University of Illinois Press, 2006, 3.

reinforced sex distinctions by premising their technological authority on traditional notions of femininity, others positioned participation in aviation as key to broadening limited understandings of womanhood. These progressive feminists refuted the idea of women's innate unsuitability for technology and argued that the act of flying itself could serve as a type of "consciousness raising" for all women.

Responding to charges that women's biological make-up kept them from successfully participating in technological and scientific pursuits, women pilots sought to blur the lines of traditional gender distinctions. Pilot Margery Brown argued, "The mental qualities demanded of women fliers are precisely the qualities demanded of men fliers."[49] As women routinely flew successfully, she argued, they disproved the notion that women at large possess a technological handicap. Pilot Helen Schunck similarly attacked socially constructed ideas about women's lack of expertise in highlighting "the fact that there are numerous men who are lacking in mechanical bent" as well.[50] If just as many men lacked technological expertise, it could not be argued that women were biologically predisposed to perform domestic duties. But Ruth Nichols, the first woman to be employed as a passenger pilot, perhaps launched the most incisive refutation of women's biological inferiority in pointing to institutional biases as the culprit for women's underdeveloped technological skills. Nichols explains, "From the mechanical angle a girl has seldom the same opportunities as a man. For instance, let's consider a brother and sister who grow up in the same family with the same advantages."[51] Nichols

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[49] Margery Brown, "Flying is Changing Women," "Flying is Changing Women," *Pictorial Review* (Jun., 1930).
[50] Helen Schunck, "Is There a Place for Women in Aviation?" *Aeronautical Review* (Dec., 1929), 39.
[51] Ruth Nichols, "You Must Fly," *Pictorial Review* 34 (Aug., 1933), 23.

goes on to trace the boy and girl as they go through school, the boy absorbing more knowledge of mechanics as he is pushed toward such classes. As a result, "when he and his sister elect to learn to fly and jointly enter ground school, sister finds brother years ahead of her in his understanding of rudiments of aeronautics."[52] In highlighting the systematic routing of women away from the fields of technology and science, Nichols implicitly provides a model for change—the need to overcome preconceived notions of women's biological limitations to improve education opportunities for women in those disciplines.

Progressive pilot Margery Brown provides the most vivid example of the way in which aviation was envisioned as a liberating technology for women. In an article provocatively titled "Flying is Changing Women," Brown declared, "Women are seeking freedom. Freedom in the skies!"[53] Brown along with fellow pilot Helen Schunk articulated a hopeful—and somewhat utopian—vision of what the newly accessible region of the air would afford women. Brown argued that "flying is a symbol of freedom from limitation," and "every woman who overcomes a limitation has gained a measure of freedom, not alone for herself but for her sex."[54] In retrospect such strong endorsements of aviation's qualities might seem a bit overstated. The hopeful visions presented by pilots such as Brown and Schunk, however, should be examined as just a few voices in a whole chorus singing the praises of aviation as the latest technological fix of the period. While aviation was marketed as a thoroughly modern new technology promising abilities never before thought possible, women carved out a very specific vision of aviation's

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[52] *Ibid.*
[53] Brown, 30.
[54] *Ibid.*

possibilities. In flying women could not only annihilate space through time like the average airline passenger, but could also gain liberation from the subjugated position of their sex on the ground. Nichols proclaimed that In addition to erasing gender distinctions, Schunck argued that class divides also disappear when in the air. Schunck explains, "When immense estates dwindle to less than doll house proportions when viewed from the air, why be concerned if one's own castle happens to be a combination living-bed room… a Rolls-Royce and Ford are indistinguishable from the air!"[55]

Arguing that there could be "no sex distinction in the region of the air," Brown directly articulated that women's use of the technology of flight would change their characters. As a result of the broadening of traditional gender ideologies, Brown argued that the nature of gender relations between men and women would inevitably change. "No longer will it be natural for [women] to take orders," Brown claimed, "On the ground they will come to act precisely the same way in which they act in the air."[56] Brown explained that the new sense of womanhood cultivated in the air would then transfer to the ground. After landing and shedding their flying coats and goggles, Brown cautioned, "Men will want them simultaneously to shed their freedom and independence, and women won't be able to do it."[57] In addition to providing a means to equalize their relations with men, Brown claimed that flying will allow women to improve their relationship with other women. Pointing to aviation's ability to forge physical connections between individuals in new ways, flying especially fostered a "bond among women, knitting womankind into a better understanding of their common problems—first

[55] Schunck, 52.
[56] *Ibid.*
[57] Brown, 108.

on the field, then in business world, and in the home," creating a "sympathy and sex-consciousness (a consciousness of one's own sex)."[58] Brown argued that the gains made by individual women in the air lent to the greater uplift of all women:

> "The woman at the wash-tub, the sewing-machine, the office-desk, and the type writer can glance up from the window when she hears the rhythmic hum of a motor overhead and say, 'If it's a woman she is helping free me, too!'"[59]

In addition to shaping the technology of flight and its social significance, Brown exemplifies the opportunity women found in flight to renegotiate shared meanings of womanhood. Because of their roles as popularizers of commercial aviation, women found an opportunity to wield scientific and technological expertise in ways that had been largely denied them according to the dictates of conventional gender ideologies.

[58] *Ibid.*
[59] Brown, 30.

CHAPTER 2

CONSUMERS OF FLIGHT: MEDIATING BOUNDARIES BETWEEN POPULAR UNDERSTANDINGS OF TECHNOLOGICAL USE AND TRADITIONAL NOTIONS OF FEMININITY

Socially constructed understandings of gender and technology not only positioned female pilots as "the greatest sales argument for aviation," but also made it possible for women as consumers to influence technological change by claiming authority as mediators of the technology of flight. During the 1920s and 30s, whether aviation would develop into an industry capable of supporting a new form of mass transportation remained unclear. This liminal position in the development of aviation created a social fluidity that allowed women to claim uncharacteristic technological authority and expertise, yet also implied certain restrictions and limitations. Understanding the functions that consumers have played in technological development is central to this analysis and has only recently begun to be explored within technology studies—a historiographical trend pioneered by historians explicitly researching gender and technology. Ruth Oldenziel explains in an article revisiting the important work Ruth Schwartz Cowan lent to this investigation, "For a long time we have accepted a static economic dichotomy between production and consumption, preventing any subtle understanding of how gender formation and technological development mutually shape each other."[60] Blurring the line between the production/operation of the aircraft and its

[60] Ruth Oldenziel, "Man the Maker, Woman the Consumer: The Consumption Junction Revisited," in A. Craeger,E. Lunbeck, & L. Schiebinger (Eds.), *Feminism in Twentieth-century Science, Technology, and Medicine* (pp. 128-148). Chicago: University of Chicago, 2001.

consumption/use makes possible an analysis of women and flight that takes seriously the contributions of women as consumers to aviation's development.

Women's importance as mediators of the technology of flight lay not just in their specialized knowledge, but also in their position as *women*—meaning members of the biologically "weaker" sex upon whom caretaking responsibilities primarily fell. Accordingly, women as consumers, but more importantly as wives, mothers, and daughters bore a special responsibility of translating the science and safety of flight to their husbands, brothers, fathers, and children. [61] Pilot Louise Thaden explained, "It has often been said by members of the industry that women as a class are doing more to retard aviation than any other one thing…I contend too, that woman holds in her hand the future of commercial aviation. Is it not the woman who urges her husband and brothers to patronize the airlines? It is the same woman who rides them herself putting men to shame; it is the woman who sends her boy and her girl to flying school…"[62] As Thaden relates, women did not need to become professional pilots to advance the cause of commercial aviation. Rather, by becoming familiar with the industry and consuming aviation by way of taking commercial flights, women could allay irrational fears concerning the danger of flight and then serve as a source of encouragement for aviation within their homes.

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[61] That women's expertise and special role within efforts to popularize aviation was ultimately couched in such a restrictive way, in my opinion, does not completely negate the importance of their technological authority. In fact, in most cases, industry proponents and executives, as well as the women themselves took very seriously women's position as technological mediators.

[62] Louise Thaden, "Pittsburgh School Bulletin," Pittsburgh Teachers Association, Inc. May 1930, *Thaden Collection*, Bx. 4 F. 1 National Air and Space Museum, Washington, D.C.

One contemporary cartoon published in the *Cleveland Plain Dealer* vividly encapsulates the potential for women to serve as such a barrier to commercial aviation's success. The cartoon features a crowd of people admiring a plane in the background; while in the foreground, several distinguished looking men are huddled together in conversation. One man remarks to the other, "Yeah, I'd buy one, but it's my wife that objects."[63] While imagined, this conversation nonetheless reminded readers of the real possibility of such an occurrence—further highlighting the need for women to abandon their irrational prejudices against flight.

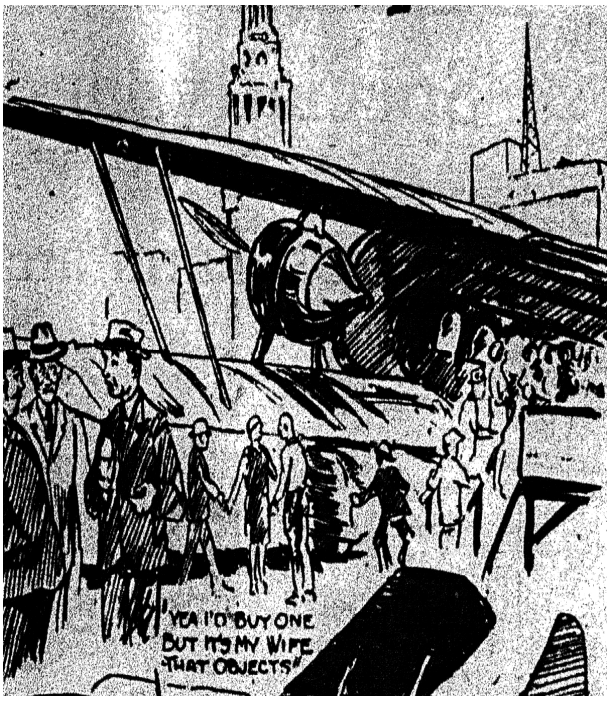

Figure 1: *Cleveland Plain Dealer* Illustration

In addition to their duties as wives, women as mothers also encouraged one another to educate their children about flight. Evidencing the possibility of a new generation of airline passengers and further confirming the need for mothers to teach

[63] What Visitors to Public Hall Display…" *Cleveland Plain Dealer*, August 25, 1929. [Figure 1]

their children about aviation, a 1928 National Education Association report, which asked 1,028 junior high students from across the country about the kind of science they desired, found an overwhelming interest in aviation. When asked to list "The Things in Science That Interest Me Most," the majority of boys listed aviation as their top choice, while the majority of girls listed astronomy as their first choice with aviation coming in a close second.[64] Not only did the survey highlight the need for aviation education in schools and at home, the student responses also revealed the fact that interest in aviation transcended gender lines.

Concerned with the safety of these eager young pilots, Earhart argued that the burden specifically fell upon women to mediate between unsafe and technologically sound flying to safeguard their children. Pointing to the fact that there exists unsafe flying just as there exists unsafe automobile driving, Earhart explains, "It seems to me it is the responsibility of parents (mothers in particular) to oversee their children's welfare by acquiring first hand flying experience…"[65] According to Earhart, mothers should combine technological expertise with their authority as mothers to effectively communicate knowledge of flight to their children. In addition to the threat of physical harm posed by misinformation, in a radio address specifically directed at women, pilot Opal Kunz warned of the negative impact women could have on their children's spirits. Kunz explained, "While aviation stands ready to give marvelous benefits to mankind…we are faced with a most serious barrier to the progress of aviation in the

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[64] Honor Webb, "The Science Young Folks Want," In the *National Education Association:*
Addresses and Proceedings, July 1-6, 1928. Vol. 66. Washington D.C.: National Education Association, 1928.
[65] Amelia Earhart, "Women's Influence on Aviation" *The Sportsman Pilot* 3 (Apr., 1930).

opposition of families and relatives, unfortunately most of them women, who oppose their dear ones in their desire to fly."[66] Kunz harshly criticized mothers who de-legitimize flight as a potential career, charging that they "break the spirit of their children so that they will never amount to anything in any field, or they will force them into paths of deceit."[67]

Considering Kunz's castigations, it does not come as a surprise that Evangeline Lindbergh—Charles Lindbergh's mother—served as the epitome of the type of "air-minded" motherhood that mothers everywhere should emulate. Evangeline Lindbergh's ability to combine her role as a science teacher with her position as a mother allowed her to be instrumental in furthering the commercial prospects of aviation. Just a year after Lindbergh's famed transatlantic flight; the National Education Association awarded Evangeline Lindbergh honorary lifetime membership to their organization. William MacCracken (the Assistant Secretary for the Aeronautics Department of Commerce) declared in a speech given in Evangeline's honor, "I say without fear of contradiction that the greatest contribution that has been made to the cause of aeronautics has been made by her whom you honor and her son."[68]

Locating their expertise as popularizers of aviation in their roles as wives and mothers, such women framed their authority in the field of aviation primarily in terms of their femininity. By upholding the framework of commonly held biological distinctions,

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[66] "Mrs. Kunz Deplores Lack of Girl Fliers," *New York Times* August 2, 1929.
[67] *Ibid.*
[68] William P. MacCraken, "Education in the Development of Aeronautics," In the *National Education Association: Addresses and Proceedings, July 1-6, 1928*. Vol. 66. Washington D.C.: National Education Association, 1928.

women were expected to transform the airplane from a dangerous machine to a comfortable technology, which could be more easily integrated into society. While these women, as users and consumers, became inextricably tied to the success of commercial aviation, the terms of their technological authority were inevitably limiting in that they solidified traditional gender boundaries. As a result, women were forced to either carefully balance their power with traditional expectations of femininity or greatly jeopardize the legitimacy of their expertise.

While the 1920s marked a turn toward a more libratory idea of femininity, popular understandings of femininity were primarily symbolized by the image of the "flapper." The image's progressivism, however, was deeply rooted in gaining power through the assertion of sexuality and the partaking of alcohol, not independence and self-sufficiency. As ambassadors of the modern convenience of flying, female pilots were likewise under pressure to appear thoroughly modern and feminine in the eye of the public. Because their roles as "lady fliers" had secured their place within aviation, presenting themselves as "aggressive feminists" or masculine in other ways would have jeopardized their success within the field.[69]

Combining reactions to women pilots' challenging of traditional gender roles and an effort to use gender as a tactic to sell aviation, industry proponents carefully emphasized women aviators' femininity. As a result, women pilots were often forced to endure demeaning titles that highlighted their femininity and de-legitimized their accomplishments as pilots. Amelia Earhart later recalled with bitterness how women pilots had to struggle simply to be referred to as pilots. "Taking their cue from

[69] Corn, 570.

[newspaper humorist Will Rogers]," she wrote, "newspaper men coined descriptive names for the affair [i.e. the 'Powder Puff Derby']… and those who flew in it variously as 'Ladybirds', 'Angels', or 'Sweethearts of the Air'."[70] Referring to a dictionary entry for the word "Ladybird," Louise Thaden likewise mocked the nicknames female pilots were given. "A Lady-bird," Thaden lampooned, "is 'a small black beetle, spotted with red, yellow, or black spots.' Although I've never quite considered myself a beetle, I have at one time or other been [accused of being] 'spotted with red, yellow or black.'"[71]

In addition to crafting ridiculous monikers, media accounts also repeatedly stressed female pilots' appearance. Instead of attributing women's success as pilots to their flying skills, a *New Yorker* article titled "Profiles: The New Woman," stated, "If you are looking for fame as a flier, blue eyes and blonde bobbed hair help, so do a cheerful smile and a good camera face."[72] Women pilots were frequently judged more on the basis of their appearance than their flight records or awards. Will Rogers, no stranger to emphasizing the femininity of women pilots, recalled first meeting pilot Marvel Crosson (who died during the 1929 Women's Air Derby) with a friend: "We both talked at the time of what a fine wholesome type of girl she [Marvel Crosson] was, no riding

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[70] Amelia Earhart, "We Take to the Air," in *The Fun of It, Random Records of My Own Flying and of Women in Aviation*, New York: Reprint Services Corp., 1932.
[71] Louise Thaden, "The Ninety-Nines and the Future of Women in Aviaton" National Aviation Forum, May 27 (c. 1937-1939), NASM Bx.4 F. 3. The year on the document found in the NASM archives was missing. The address, however, was given to the Ninety-Nines meeting and mentions the establishment of a memorial fund for Earhart, which places it between the date when she was missing and, more likely, closer to 1939 when she was officially assumed dead.
[72] Helena Huntington Smith, "Profiles: The New Woman," *The New Yorker* May 10, 1930, 28.

boots or riding breeches or spurs or anything but just a neat gray suit."[73] Rogers thus handed out a moral judgment on women who chose to wear "masculine" flying uniforms, suggesting they were somehow un-wholesome.

Because nothing screamed masculine quite as loudly as bulky flight suits, women pilots carefully strove to avoid such moral condemnations by maintaining a stylish appearance—a fact the media emphasized. In most cases they avoided heavy flight jackets and boots, yet even when worn, the *St. Louis Post-Dispatch* noted, "Coveralls and white helmets were removed [after landing] by most of the flyers, revealing a variety of sport dresses, knickies and riding costumes." As one reporter noticed, even Amelia Earhart, one of the most ardent voices for equality, often didn't bother to "cover her sport dress and small felt hat while flying."[74] The media also imposed the centrality of such superficial matters, with one article on the 1929 Derby sub-headed, "What to Wear Is Question." The article reported Ruth Elder's description of her own ritualistic "flying" regime: "I put on rouge and lipstick at each stop." Although pilots like Elder reinforced the "Powder Puff" aspect of the race, some did not concern themselves with such frivolities. With apparent astonishment the article noted such deviation in their description of competitor Marvel Crosson: "Miss Crosson isn't even going to send any clothes ahead of her. 'I'll wear a dress under my aviator's coat,' she said, 'and carry a toothbrush. That's all.'"[75] Competitor Gladys O'Donnell expressed a similar approach to race wear. O'Donnell commented to a journalist that she would be donning coveralls

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[73] Will Rogers, "Will Rogers on Diplomacy, Servants and Fatal Air Derby," *New York Times*, August 22, 1929, 25.
[74] "15 Women Flyers Land at East Side Airport on Seventh Day of Race," *St. Louise Post-Dispatch*, August 25, 1929, 4.
[75] J.D Spiro, "Women Pilots to Hop Today At Shot Here," *Cleveland Plain Dealer*, August 18, 1929.

and "nothing else" as "Flying fast will be hard work." In contrast to the majority of competitors who were seen wearing dresses and skirts, O'Donnell emphasized the work involved in flying and the need for functionality in dress, adding "[flying] is no tea party."[76] Both Crosson and O'Donnell represent pilots who, above all pressure, challenged popular conceptions of female appearance.

While some pilots chose not to conform to pressures to appear feminine, since a commonly shared goal was to spread aviation to other women, most pilots recognized that it was important always to remain appealing to the masses of women watching the race. Both Thaden and Earhart were conscious of not letting the ugly pilot's garb detract potential fliers.[77] One cartoon depicting a scene from an air show to be displayed in Cleveland presented the possibility of such an occurrence. The drawing featured two elegantly dressed women evaluating a female pilot near her plane. Referring to the pilot's suit one woman mockingly comments to the other, "And just think of the duck pants you could wear…"[78] The fashion industry, as well, seized the marketing opportunity that the style craze surrounding aviation provided, with one article headline reading, "Paris Creates Women's Flying Travel Costume." The article describes fashionable outfits composed of tweed coats with embellished flowers layering over lacy blouses.[79] As appearance and fashion began to take center stage, the need to always be conscious of one's public image detracted from women's actual achievements as fliers as

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[76] "Women Flyers Speed to City" *Cleveland Plain Dealer*, August 19, 1929, 6.
[77] Corn, "Making Flying 'Thinkable': Women Pilots and the Selling of Aviation, 1927-1940", 566.
[78] "What Visitors to Public Hall Display…" *Cleveland Plain Dealer*, August 25, 1929. [Figure 2]
[79] "Paris Creates Women's Flying Costume," *Columbus Evening Dispatch*, August 22, 1929.

well as increasingly encouraged superficiality over functionality in women pilots' dress. (See Figure 2)

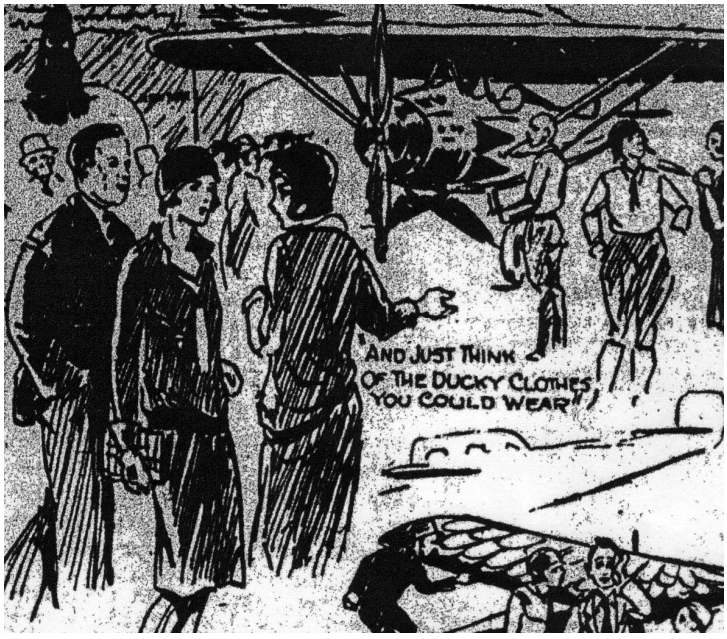

Figure 2: *Cleveland Plain Dealer* Illustration 2

Beyond just appearing feminine, the media encouraged pilots to act feminine as well. One United Food Stores advertisement featuring a stylishly dressed woman with planes buzzing around behind her, illustrates this specific message to women. Upon first glance the title "GO TO THE AIR RACES" seems to be positively encouraging women to participate in the promotion of aviation. The smaller inscription on the ad, however, bears a different message, "You should enjoy this great event with thousands of others. We'll help you get the time—just reach for a telephone, we'll deliver your food wants and at no higher cost." While promoting their delivery service they inevitably send a

very clear instruction to women: be a progressive curious woman but make sure to do your chores first. (Figure 3)[80]

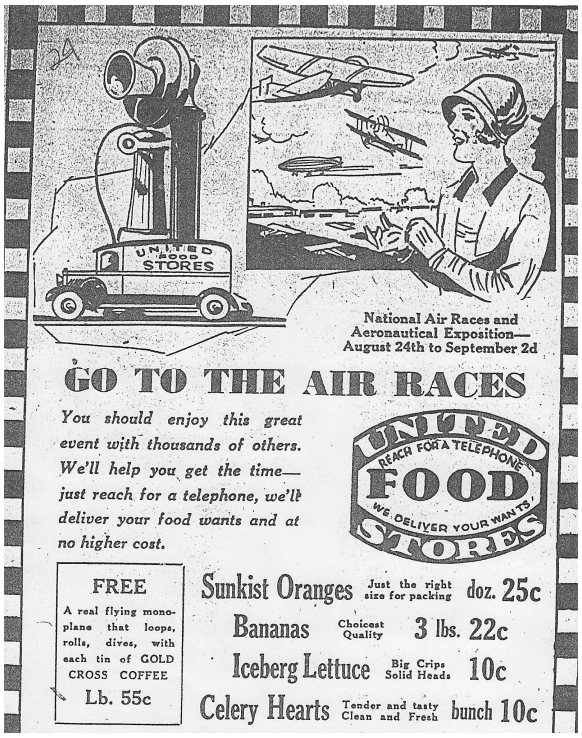

Figure 3: United Food Stores Advertisement

Women who did not fulfill such prescribed duties were looked upon suspiciously and female pilots who engaged more in stereotypically masculine than feminine activities were viewed as threats to the traditional gender order. For example, articles in popular magazines sought to explain Louise Thaden's famous success in flight as a product of her "boyish" character. In an article titled "Louise Liked Toy Engines Better Than Dolls, Says Dad," Thaden's father explained that his daughter always shunned "girl" toys as a child, preferring to play with "boyish" mechanical toys. McPhetridge confessed that

[80] United Food Stores Advertisement, *Cleveland Plain Dealer* August 24, 1929, 5. [Figure 3]

Louise spent more time "with small motors."[81] Thaden's father claimed that she even learned to drive the family car at age 12 and, as she grew older, learned to perform mechanical work on the auto as well.[82] Another article traced Thaden's decision to "invade one of man's most dangerous fields" to her regret that "she is of the gentler sex."[83] Thaden's mother similarly attempted to explain the roots of her "masculine" activities stating, "Louise always made a 'pal' for her father. As a girl she was a tree-climber, a follower of boyish pursuits, and anything but an indifferent baseball player…her father and I came to know years ago that when she chose a life-work that it would be in competition with men."[84] Instead of recognizing the possibility that a woman could be interested in something mechanical such as flying without being deemed "masculine," Thaden's parents sought an explanation for her penchant for flight through painting Thaden as innately "boyish." Recognizing the implications of likening Thaden to men to such a degree, the author quickly backpedaled to preempt any questions about Thaden's sexual identity: "But let us not draw any wrong conclusions. Miss McPhetridge is charmingly feminine, musical and a girl's girl."[85] Concerns over the potential for lesbianism provided yet another motivation for female pilots to carefully balance their technological roles with notions of appropriate expressions of femininity.

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[81] R.F. McPhetridge "Louise Liked Toy Engines Better Than Dolls, Says Dad" *The Wichita Evening Eagle*, August 26, 1929.
[82] R.F. McPhetridge, "Louise Liked Toy Engines Better Than Dolls, Dad Says," *The Wichita Evening Eagle*, August 26, 1929. The Louise Thaden Collection, National Air and Space Museum. Washington, DC.
[83] "Beautiful Wichita Girl Flies! And How! Sells Travel Airs," *The Wichita Evening Eagle*, December 31, 1927. The Louise Thaden Collection, National Air and Space Museum. Washington, DC.
[84] "Beautiful Wichita Girl Flies! And How! Sells Travel Airs" *The Wichita Evening Eagle* December 31, 1927, 7.
[85] *Ibid.*

Tensions between seemingly "masculine women" and "traditional women" bled over from reality into aviation fiction as well. Numerous advertisements in the *Cleveland Plain Dealer* during the summer of 1929, for example, promoted a new fictional series to be published in the paper by Barbara Webb the "Plain Dealer Girl Reporter." The series "Golden Girl" was described as a story "of flying fields, intrepid birdmen and the girls they love." The plot centers around two women, one donning a pilot's uniform the other a society dress. The story line clearly exhibits the tensions between "masculinized" and highly feminine images of women. Pitting the two versions of female representation against one another, the story focuses on the competition between two characters for attention from the heroic male pilot of the story, their "birdman."[86]

While a fictional example, the story highlights the tensions bound up in women's roles as technological mediators. Since traditional understandings of womanhood had opened up the opportunity for women to gain authority in popularizing aviation, threats of women challenging the dictates of conventional femininity took center stage. Understanding the influential role women played as consumers in efforts to popularize commercial aviation, further stresses the need for historians to re-evaluate who we consider relevant actors in studying the nature of technological change.

[86] "Golden Girl." Advertisement. *Cleveland Plain Dealer*, August 26, 1929.

CHAPTER 3

"AN ASSOCIATION OF OUR OWN": WOMEN PILOTS AND THE ORGANIZATION OF THE "NINETY-NINES"

On August 18, 1929, women competing in the first women's transcontinental air race took off from Santa Monica, California embarking on a grueling eight-day rush to Cleveland, Ohio. The 1929 Women's Air Derby not only brought together top women pilots from across the country, but also opened up a vital network of communication between women in aviation. Encouraged by their growing visibility within the field, these women worked to solidify newly cultivated social and professional bonds through formal organization. Inspired by this newfound solidarity, a group of derby contestants founded the Ninety-Nines Organization of Women Pilots—the first nationally organized group of female pilots. Examining the function, goals, and organization of the Ninety-Nines not only sheds new light on the backgrounds and goals of early women pilots themselves, but also reveals the unique position women pilots occupied within the context of women's scientific and technical organizations of the period. The Ninety-Nines facilitated personal connections between pilots, provided a forum for sharing job opportunities in aviation, publicized records set by female pilots, and collected invaluable statistical profiles of early licensed women pilots.

While "the weather was only so-so" on November 7, 1929, when the first Ninety-Nines meeting convened in an airplane hangar at Curtiss Field on Long Island, reports revealed that regardless of the elements, "four of the twenty-six women who came

together…arrived by air."[87] The remaining attendees arrived by train and automobile, joining the meeting amidst the "noises of spinning motors… hammers and paint sprays."[88] In spite of the airport ambiance, attempting to maintain some of the markings of a dignified "society" meeting, the women handily transformed a mechanic's bench on wheels into an "admirable tea cart."[89] The choice to forgo the comforts of a furnished reception hall in favor of the makeshift mechanisms of their trade illustrates the complex nature of the goals set forth by the Ninety-Nines. The members' commitment to emphasizing their seriousness as pilots, while at the same time redefining the boundaries of traditional technological use, as I shall argue, ultimately shaped the contours of their organization.

From their first efforts at organization, the group's creators began to self-consciously explore the potential place the Ninety-Nines should occupy within the aviation industry. On October 9, 1929 an official letter calling for the formation of an organization of women pilots was sent to licensed pilots throughout the country. In addition to the twenty-six women who attended the first meeting, seventy-three responded to the call for membership via letter, producing a total of ninety-nine charter members—officially christening the group as the "Ninety-Nines." Addressed to "Dear Licensed Pilot," the letter pointed to a commonly felt sentiment amongst female pilots: that "women pilots in this country should have some sort of an association of our own."[90] Looking to the model presented by men's national aviation associations, such as NAPA

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[87] "Women and Aviation," Clara Trenekman, Curtiss Wright Flying Service, November 17, 1929, 1. IWASM
[88] *Ibid.*
[89] *Ibid.*
[90] "Letter to 117 Women Pilots," The Ninety-Nines Org., October 9, 1929, IWASM

and Early Bird, women pilots sought to construct an organization tailored to their own specific needs within the industry. The early organizers of the Ninety-Nines envisioned the group as providing "a way to get acquainted, to discuss the prospects for women pilots from both a sports and breadwinning point of view, and to tip [fellow pilots] off on what's going on in the industry."[91]

Women pilots during this period, however, were not unique in their efforts to organize professionally. Their organizational impetus was part of a shared movement in the 1920s and 30s amongst women working in the increasingly professionalized realms of science and technology. As Margaret Rossiter demonstrates in her critical examination of women scientists in America, many women involved in scientific or technological work, "either withdrew from the [field] or created their own separate groups and prizes to supplement their otherwise unacknowledged existence in science."[92] Rossiter explains that this network of women's organizations and awards had wide-ranging effects, playing an important role in the professional lives of thousands of women in science during the period. In addition to providing career information, women's scientific societies also gave women "a certain sense of belonging and acceptance, encouragement and psychological support, and a chance to be active in some role, including the leadership positions denied them in male-dominated societies."[93]

Facing similar challenges as the women scientists described by Rossiter, women pilots also organized in an effort to combat professional barriers faced by women working in fields traditionally deemed masculine. Often marginalized within the male

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[91] *Ibid.*
[92] Margaret Rossiter, *Women Scientists in America*, Baltimore: Johns Hopkins University Press, 1982, 297.
[93] Rossiter, 297.

dominated national aviation organizations, women pilots not only gained crucial support through the Ninety-Nines, but also achieved new positions of national leadership within their profession. Despite common experiences, however, a crucial difference emerges between the women's scientific societies highlighted by Rossiter and the Ninety-Nines organization of women pilots. While Rossiter explains that women scientists in the 1920s and 30s organized primarily to gain attention within a field in which they were otherwise largely ignored, women pilots during the same period experienced a vastly different public reception. Because of their unique positions as popularizers of aviation, women were celebrated rather than ignored as pilots. That is not to say, however, that women pilots did not face challenges as professionals in aviation—as the warm reception of women pilots was primarily a reflection of the viable sales solution women presented for commercial aviation, rather than a genuine affirmation of women's capabilities as scientific and technological actors. The different public responses to women pilots and women scientists played a decisive factor in determining the shape their organizations would take. Rossiter explains that the general marginalization of women scientists led their societies to develop "conservative and non-confrontational" aims. Rossiter argues, "Rather than attacking the status quo or the male establishment that had excluded them, the members of these clubs accepted the separate spheres and worked to make the best of the segregation."[94] In contrast, the Ninety-Nines did not primarily aim to increase awareness and recognition of women pilots; rather, they sought to emphasize the "seriousness" of their technological capabilities and career ambitions. Rather than

[94] Rossiter, 297.

accepting professional segregation, dialogue between members reveals that the organization consistently championed the equality of men and women pilots.

On December 31, 1929, acting president of the Ninety- Nines, Opal Kunz sent a letter to members opening an organizational dialogue about the place of women in aviation. This letter and the responses it elicited provides key insight into the various ways members envisioned women's role in aviation. Kunz began her letter by proclaiming, "The impression seems to have gone out that we girl pilots have some sort of conflict with the men pilots."[95] Emphatically denying that this sentiment exists among women fliers, Kunz instead argued, "As a matter of fact we are trying to bring about a different attitude toward the girl in aviation, whereby, she is accepted as an equal rather than spoiled as something rare and very precious."[96] Reacting to the level of public attention garnered by women pilots, Kunz explained that, in her opinion, women have actually received more gratitude than they deserve in relation to their achievements within the profession. Kunz warned, "At present our strong point seems to be that because there are so few of us doing this work, we receive more attention from the public." As a result, she explained, "many girls receive high salaries and fine positions because it is thought they are more valuable from a publicity angle than a man would be in the same position…[yet] this will not always be true." According to Kunz, as the public increasingly begins to expect women to fly, they will no longer be given special privileges. With this problem in mind she announced that the aim of the Ninety-Nines

[95] Kunz letter, IWASM
[96] *Ibid.*

should be to encourage women to enroll in flying schools with "the determination not to accept any special consideration because of her sex."[97]

Despite Kunz's emphasis on the need to eliminate what she terms "the sex idea in flying," periodically throughout the letter she strikes a more conservative tone, which Rossiter characterizes as more typical of women's scientific societies during the 1920s and 30s. Pointing to the men who flew during WWI, Kunz argued, "The aviators in the war accomplished feats and made records that surely no woman can ever hope to attain." Yet, she goes on to state in the following sentence: "We believe that our girls can and will learn to fly as well as the average man, [even] better than many…"[98] Kunz's seemingly contradictory endorsement of women pilots represents the need for women fliers, as well as the Ninety-Nines as a whole, to strike a delicate balance between asserting their technological capabilities and being interpreted as "militant girl pilots."[99] This tension represents a common thread linking the bulk of member responses to Kunz's letter.

Several Ninety-Nines members responded to Kunz's letter articulating their belief that women could serve as important "help-meets" to men in aviation. Pilot Elizabeth Place explained that after wanting to learn to fly for a number of years, she finally decided to enroll in a ground course only after her husband had returned to his career in airplane sales. Place wrote that she learned to fly "hoping to be of value" to her husband in his airplane sales work.[100] Rather than fighting men in aviation, other female pilots, along with Place, instead responded that women should be grateful for the assistance

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[97] *Ibid.*
[98] *Ibid.*
[99] *Ibid.*
[100] Elizabeth Place letter IWASM.

offered to them by men. Pilot Madeline Kelly wrote, "Surely there is no arbitrary feeling toward us by the men who have taught us all we know and are constantly helping us in every way," adding that it would be "ungrateful… to have this feeling toward them."[101] Similarly, pilot Melba Gorby emphatically declared, "And HOW WE DO OWE something to those patient and understanding men who trusted us with their ships during those first 15 hours solo!"[102] While the deferential appreciation expressed by Gorby and Kelly does not likely reflect the position of all women pilots, their views nonetheless underscore a very practical reality. Since the members of the Ninety-Nines were among the first female pilots in the country, their flight instructors would have certainly been mostly men. This fact helps to better contextualize the sentiments of pilots like Kelly and Gorby who felt that they owed much of their success in aviation to their male counterparts.

Replying to Kunz's letter, pilot and journalist Margery Brown expressed her astonishment at the reported negative feelings between men and women pilots, explaining "it never occurred to me that anyone thot [sic] we were trying to shove the men out of the sky. Goodness knows, there is room enough for both of us up there!"[103] Brown argued that rather than feeling irritated by women's presence in aviation, men should instead "be flattered that [women] want to abolish sex from the skies by making [themselves] more like them, in certain respects."[104] Clearly recapitulating Kunz's fear of women appearing too combative, Brown attempts to even further remove the supposed threat women presented by assuring that in looking to imitate men, women did not seek to "become

[101] Madeline Kelly letter IWASM.
[102] Melba Gorby letter IWASM.
[103] Margery Brown letter IWASM, 2.
[104] *Ibid.*

mannish" in their ways.[105] Yet Margery Brown herself proves a particularly illustrative example of the complex trajectory of the way women viewed their place in aviation.

While Brown presents a very cautious stance in her reply to Kunz's letter, in the course of the next year her writing grew increasingly progressive and more closely associated with overtly feminist aims. In an article written for the fairly mainstream *Pictorial Review* titled "Flying is Changing Women," Brown provocatively declared, "A woman who can find fulfillment in the skies will never again need to live her life in some man's spare moments."[106] Certainly a far cry from her previous conciliatory promise to share the sky with men, Brown's article represents women's growing assertiveness within the field. Brown's rhetorical transformation also serves as a reminder that the initial dialogue between Ninety-Nines members should be understood within the context of a nascent organization self-consciously working to secure a position for itself within the largely masculine field.

In contrast to these early conversations, subsequent organizational correspondence relating to professional opportunities available to women, more closely resembled Brown's later progressive vision. In their responses to Opal Kunz's letter, many members voiced their concern with finding a position within the field of aviation. Pilot Margaret Willis emphasized her own financial situation explaining, "I have found it necessary to drop my own flying temporarily due to the fact that I am trying to finish college and also due to lack of funds." Expressing her interest in finding a position in aviation, Willis proposed that the club be used informally as a job network, whereby

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[105] *Ibid.*
[106] Margery Brown. "Flying is Changing Women." *Pictorial Review* June 1930: 109.

word of positions would be passed around to group members.[107] As a result, the Ninety-Nines responded by dedicating organizational dialogue to highlighting the career opportunities for women in aviation.

Acknowledging the difficulties many women faced in finding work as pilots, the Ninety-Nines encouraged women's participation in all facets of aviation. One organizational memo with the heading "Women As Aviation Editors of Daily Newspapers" explored the success women had enjoyed in aviation from a journalistic standpoint. The memo triumphantly declared, "If you have ever been in one of those cities in which a woman is holding down an aviation editorship of a newspaper, you have seen one or more men swell out their chests and heard them say proudly, 'We have a woman aviation editor on one of our papers.'"[108] Rather remarkably, the memo details seven cities across the country, which employed female aviation editors. While a seemingly peripheral position in the context of the industry as a whole, the memo highlights the unique level of technological authority these women occupied. "When the inhabitants of at least seven cities in this country pick up their morning papers to see what is going on in the field of aviation," it explained, "they are turning to a woman for information on that subject…"[109] These women also had to wield a "thorough understanding of aeronautical terms" and concepts. As aviation editors for newspapers, women were not only charged with developing a working technical knowledge of aviation, but also with the task of successfully communicating aviation developments to masses of eager readers.

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[107] Margaret Willis letter IWASM.
[108] "Women and Aviation" December 15, 1929 IWASM.
[109] *Ibid.*

In addition to providing positive encouragement to women seeking jobs in aviation, Ninety-Nines organizational communications also served to refute inaccurate representations of women's prospects within the field. One December 22, 1929 memo focused entirely on an article published the same month in the *Aeronautical Review* by Helen Schunck, titled, "Is There a Place for Women in Aviation?" The memo begins, "Rabid feminist as she says she is, Helen K. Schunck… asks whether there is a place for a woman in aviation, affirms there is, and that the place is that of a passenger in a transport plane."[110] The memo directly calls into question the veracity of Schunck's self-professed feminist aims as she restricts women's primary role in aviation to that of passenger. Countering Schunck's claims, the memo stated, "Women are already filling many important and adequately salaried positions in aviation and will undoubtedly continue to do so in increasing numbers."[111]

Schnuck reportedly argues that while women are capable of flying for pleasure, they will not succeed in flying for a living as professional barriers for women in aviation prove too great. In refuting Schnuck's discouraging projection, the memo conjures up early Ninety-Nines arguments about the advantageous publicity value of female pilots. The memo argued, "In fact it has been stated frequently and borne out by weight of evidence that a woman pilot can sometimes secure the same job with the same pay as a man who has much more flying time… [because she] has greater publicity value than a man."[112] In further critiquing Schunck's assertion that most women are unable to "talk 'horses' and r.p.m.s intelligently," the memo concluded: "Too many trails have been

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[110] "A Look at Some Aviation Magazines," December 22, 1929. IWASM.
[111] *Ibid.*
[112] *Ibid.*

blazed in other directions by women in this field, to permit us to put much faith in Miss Schunck's calm consignment of all womankind to the passenger's seat and to piloting for sport only."[113]

To best service the large numbers of such *trailblazing* women in aviation, Ninety-Nines members struggled over determining the contours of an organization dedicated to the average female pilot. Organizers faced the particular challenge of striking a delicate balance between making use of the valuable experience and publicity of famous pilots, such as Amelia Earhart, while also remaining sensitive to the needs of the less notable majority of fliers—a task which frequently elicited considerable discord within the group. Tellingly, tensions surrounding the creation of a multilateral organizational structure that did not preference the group's more famous pilots became the subject of a major organizational debate.

On March 7, 1930, Acting President Opal Kunz circulated a letter within the group addressing what she referred to as organizational "friction."[114] Kunz explained that controversy arose after the December 1929 meeting, which she hosted at her home. At the meeting, members created a nominating committee that assembled a ballot for the first official Ninety-Nines election. However, as Kunz derisively quipped, several Ninety-Nines members, "who did not find time to come to the meeting," publicly challenged the legality of the ballot created in their stead.[115] As it turned out, Amelia Earhart and Ruth Nichols, two of the most publicized female pilots of the time, functioned as the leading culprits behind the challenge. Kunz explained that the

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[113] *Ibid.* 2.
[114] Opal Kunz, letter, March 7, 1930
[115] *Ibid.*

decisions made at the meeting by the twenty-eight women present—"the largest [group] attendance…to the present date"—should outweigh the personal inclinations of a few of the group's more prominent members, and that the ballot should stand. Kunz does not attempt to mitigate her displeasure with Earhart and Nichols's interference, recalling that after postponing the meeting for two weeks in order for both to attend, "it seems surprising that they should start trying to dictate the policies of the '99's'" considering they failed to show up.[116]

While the acerbic tone of Kunz's castigation certainly invites speculation of a personal clash between the women, the primary weight of her critique remains clear: Kunz steadfastly advocates the preservation of a level organizational playing field among all members—regardless of status. Likely aware that the subjects of her censure might perceive her reprimand as primarily *ad hominem* in nature, Kunz graciously concluded, "Both Ruth Nichols and Amelia Earhart have accomplished a great deal for aviation… and have a definite place [in the organization] which is important." In fact, Kunz offered that she would be "perfectly willing to let the affairs of the '99's' rest in their hands." Yet, only under one condition—which she forcibly asserted: "*provided the majority of the girls so desire*."[117] In attempting to preserve the organizational will of the majority, Kunz asserted that sectional struggles over power also materialized along geographical boundaries—a struggle further complicated by the exceptionally mobile nature of the group of pilots.

In her letter to the Ninety-Nines, Kunz directly called for members to reject a motion proposed by Ruth Nichols designed to exclusively restrict Ninety-Nines

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[116] *Ibid.*
[117] *Ibid.,* 3. Emphasis in original.

members' voting capabilities to their "home" region.[118] Kunz explained that this policy would give preferential treatment to members of the New England region, the section to which she belonged along with Earhart and Nichols, citing that "they have been well represented at every meeting."[119] As the members of the New England group possessed the resources necessary to both hold and attend more regularly scheduled meetings (partly a function of their collective prominence within the field of aviation, to be sure), their "voice" often commanded more organizational weight in terms of the number and frequency of their region's votes. Nichols's proposal ensured that women living outside of New England would not be able to cast a vote at its regional meeting, and, therefore, would be denied access to the section's unparalleled ability to influence national Ninety-Nines policy. Kunz emphatically opposed the solidification of such a privileged voting

[118] At this early point in the life of the organization, Ninety-Nines members struggled to determine how the group should integrate regional operations within the context of the national organizational. This debate sparked questions concerning which meetings should be distinguished as "national" and which "regional," as well as which members should be permitted to vote at different meetings. Ruth Nichols's motion, which I cite in Kunz's ensuing discussion, arose out of the context of this organizational debate. Nichols's solution to the regional-national disconnect involved organizing member voting according to region, which would eliminate the need for votes at national meetings. It is this implied result of Nichols's proposal with which Kunz takes issue in her explanation of how the preference of regional operations would lead to organizational inequity.

[119] *Ibid*, 2. At first glance it seems shocking that any individual would voluntarily concede the necessity of curtailing his or her own power (especially since such occurrences appear infrequently throughout history). Because of this ostensible irregularity, Kunz's effort to check the power of her own New England section certainly invites further evaluation. Considering Kunz's specific targeting of Earhart and Nichols (her fellow section members) as overshadowing more ordinary pilots, I assert that Kunz's efforts to distribute power equally among members are at least partially self-motivated—as Kunz likely struggled herself to gain a voice within the New England region in the face of such note worthies. Assuming the veracity of the dynamic between this tripartite, an analysis of the considerable thrust with which Kunz advocates organizational equality acquires new depth and complexity, yet does not necessarily impugn the intent of her vision that the Ninety-Nines should remain committed to the average woman pilot.

block and, instead, emphasized the necessity of retaining the Ninety-Nines' commitment to multilateral governance. Refusing to mince words in her unflagging support of the value that "ordinary" pilots lent the organization, Kunz pointedly stated, "As long as I have anything to do with the management of the '99's' the policies which have prevailed so far will continue: *That any member of the '99's' who cares to come to a meeting, has an equal right with any other member. We want the ideas of as many of the girls as possible, at all times, and we ought to serve every girl with a strictly impersonal and fair policy.*"[120]

As a result of Kunz's fairly provocative March 7 letter, a heated debate ensued at the March 15, 1930 Ninety-Nines meeting. The official meeting minutes, which contain a transcript of the discussion that took place, revealed several members' shared concerns about sectional tensions within the organization. The minutes indicate that Opal Kunz herself, the Acting Chairman, called the meeting to order followed by a ceremonious recitation of the Lord's Prayer. After shortly pausing to atone their sins, members immediately turned to pointing fingers at one another. Louise Thaden, winner of the 1929 Women's Air Derby and soon-to-be first vice-president elected by the Ninety-Nines, explained, "Blanch Noyes and I, talking a few minutes before the meeting, found that the girls in our sections were getting to the point where they felt the eastern group was trying to run things."[121] "This feeling," she continued, "is not very healthy."[122] Despite observing the same sectional tensions addressed by Kunz, Thaden nonetheless concluded that Kunz's letter was "unfortunate." Unwilling to separate Kunz's critique of

[120] *Ibid.*, 2. Emphasis in original.
[121] "'99s' Minutes of March 15, 1930," 2.
[122] *Ibid.*

the New England group from her apparent privileged membership in the region, Thaden perceived Kunz's letter as further evidence of the petty clamoring for power that characterized the section's aims as a whole.[123] Thaden continued her critique by citing the invariability of the national meeting location. Thaden explained, "With the national meetings all [in New York], naturally everybody outside feels terribly secluded, and always will.[124] Instead, Thaden argued that meetings could be held in a more central location in order to encourage attendance.

What seemed a potential alliance between Kunz and Thaden, considering their common interest in keeping organizational power out of the hands of the few, quickly devolved into a palpable rivalry—complete with verbal sparring. Feeling personally affronted by Thaden's comments, a rather dramatic moment occurred when Kunz offered to remove herself from the position of Acting Chair as a result of a purported lack of confidence in her ability to lead. Yet, the tension between the two women did not end there. In response to Thaden's claim that New York meetings were impractical for the majority of members, Kunz emphasized the exceptionality of an organization comprised of women pilots. Characterizing Thaden's accusations as "unfair," Kunz argued, "It is impossible to organize this club along the lines of other clubs. We are all fliers. This is not the only national meeting. Wherever we are, we can go to that meeting. All meetings are considered national."[125] Kunz maintained that because of the extraordinary mobility of members, no one could reasonably argue that any specific meeting location would bar certain members from attending. The obvious disagreement between the two pilots,

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[123] *Ibid.*
[124] *Ibid.,* 4.
[125] *Ibid.* 5.

however, reached its pinnacle (or nadir) a bit later in the meeting. After claiming that she did not clearly hear the statement of a motion being discussed, Thaden asked that the motion be repeated—to which Kunz curtly replied, "Too bad she didn't hear," and refused to restate the matter.[126] Such lively dialogue not only provides an entertaining reading of an otherwise potentially dryly written meeting summary, but also reveals a glimpse of the bitter struggle that took place to determine the structure and direction of the organization. Out of the dynamic competition of diverse personalities, individual aspirations, and regional power plays, the Ninety-Nines emerged from such organizational "friction" a group striving to fill the needs of the "average" female pilot while giving each her due recognition.

Evidencing the much-touted value of less notable pilots whose names often remained obscured by the shadow of a few stars, Ninety-Nines organization memos publicized encouraging stories about women pilots whose accomplishments would otherwise go unnoticed. While they didn't fly solo across the Atlantic or win a national air race, one organizational communication documents the stories of average pilots Ethel Lovelace and Dorothy Stocker. Representing the paragon of air-minded motherhood, Lovelace gains notice because her two sons reportedly "tease her to take them airplane riding instead of to buy them candy."[127] On a slightly more theatrical note, Stocker's mention comes at the cost of daringly stowing away on a plane in order to "watch a [mid-flight] refueling at close range." To further emphasize the heroism involved, the memo remarks that during the flight, "sometimes the ships were only ten feet apart, and if the

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[126] *Ibid.* 6.
[127] "Texas Women Organize for Flying," December 8, 1929, 2. IWASM. These Ninety-Nines Newsletters are unauthored.

gasoline had exploded, she would not have been here to tell the tale."[128] While neither of these women would ever reach the same levels of notoriety as famous female pilots such as Amelia Earhart, the Ninety-Nines nonetheless provided a forum for their involvement in aviation to be recognized.

In addition to informal recognition of women fliers' accomplishments, the Ninety-Nines also publicized official competitive records set by women pilots. The practice of establishing separate women's records was a task familiar to many women's scientific and technological societies. Margaret Rossiter explains that most women's scientific societies established women's prizes and records in order to "make the top women in the field more visible," which in turn "increased the pressure on the main organizations to notice them and acknowledge their presence and contributions."[129] Using this process, women pilots were able to put pressure on the governing body of competitive aviation records, the Fédération Aéronautique Internationale, to officially recognize women's records in 1929.[130] The Ninety-Nines championed, "If a woman can fly faster, farther, higher, or stay up longer than other women…that fact deserves official recognition."[131] Rather than including women's records within the larger body, however, the FAI established a separate category for women's accomplishments. Perceiving this move as a possible devaluation of their work, the Ninety-Nines explained, "There is no reason why women's records will not some day stand neck and neck with those of men. In the meantime their own notches in their own log of records are deserving of the

[128] *Ibid.*
[129] Rossiter, 305.
[130] *Ladybirds*
[131] "Records by Women Pilots," December 24, 1929 IWASM

official recognition that will henceforth be accorded to them."[132] In addition, addressing the problem of what to do with records established before FAI recognition, one memo detailed that all records would stand even though they were previously set. The group avoided erasing the work already accomplished by pilots in refusing to give ultimate primacy to the official record. As a result, the Ninety-Nines remained committed to publicizing records set by women in both official and non-official capacities. Accordingly, a permanent section in Ninety-Nines periodicals focused specifically on recounting the newest records set by women, as well as recent licensing certifications.

While official records provided competitive women fliers more visibility, Rossiter's analysis of women's records further highlights an important point about the fate of the average woman pilot of the 1920s and 30s. While women's aviation records provided the best means for a select few women to gain individual prominence, those women who did not fly competitively remained largely obscured from the historical record. Remaining true to its commitment to supporting women fliers from all walks of life, however, the Ninety-Nines worked earnestly to meet the needs of the average female pilot as well. In the early 1930s the Ninety-Nines circulated a survey to current holders of Department of Commerce licenses in order to, as the questionnaire reports, "compile some authoritative information concerning the activities of women pilots today."[133] From the information contained in these surveys emerges the most detailed picture of the average woman pilot during the period that has yet to be uncovered. While a body of scholarship exists devoted to pilots such as Amelia Earhart, who were in the business of

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[132] *Ibid.*

[133] "Women Pilot's Questionnaire," IWASM. While it is not clear the exact date that the surveys were circulated, dates written on completed surveys range from 1932 to 1933.

making a name for themselves, relatively little has been written with the aim of understanding the lives of average women pilots who contributed much to the popularization of commercial aviation. The relative dearth of information recorded about women who did not seek to gain fame or fly competitively has proven the most significant barrier to understanding the aims and backgrounds of the majority of women pilots in the 1920s and 30s. The Ninety-Nines' organizational commitment to collecting information on all women pilots, not just group members, affords a detailed examination of women who flew during the period.

According to Department of Commerce records, 450 women held pilots licenses in 1932.[134] Assuming that (as purported) the Ninety-Nines circulated questionnaires to all women holding a license, they received responses from a little over a quarter of all women pilots in 1932—collecting 132 surveys in all. While this statistical sketch of female pilots provides the most complete picture as yet discovered, the picture admittedly remains a bit blurry as it is still based on a relatively narrow pool of selection. However, despite this limitation, responses reveal a rather geographically diverse survey— coming from 34 different states across the country, with the greatest concentration of women pilots residing in California. The ages of the majority of women who responded fell between 20 and 30 years old. In addition, and perhaps somewhat not surprisingly, most women were single, had no children, and flew primarily for sport. More unexpectedly, however, a near majority—43 percent—owned their own plane.

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[134] Amelia Earhart, "We Take to the Air," *The Fun of It, Random Records of My Own Flying and of Women in Aviation*, New York: Reprint Services Corp., 1932.

The importance of these surveys, however, goes beyond providing a basic biographical sketch of the average female pilot in 1932. While popular media gave much attention to women pilots in the name of "selling" commercial aviation to the public, as noted in previous chapters, this notice largely served to reinforce the popular caricature of a vivacious flying beauty seeking fame. The information provided in comments written on the backs of these surveys, however, deconstructs this caricature by revealing the real concerns, motivations, and barriers faced by women pilots.

A concern for the financial logistics of both attaining and maintaining a pilots license represents the most common theme that emerges from survey responses. The most serious financial barrier faced by women was the expense of logging enough hours to, first, obtain a license and, second, to keep a license current by flying a minimum number of hours. Several pilots' responses illustrate the potentially dire affects of this particular financial burden. Clara Kutschinski who worked as a secretary of a flying club in Michigan reported that she would have to "give up" her private license in the coming months until she could "afford to get in some more hours." In addition, Kutschinski confessed that she was even unable to join the Ninety-Nines because she could not afford the dues.[135] In addition, pilot Leah Zergler related that she too faced a similar fate: "I am losing my license because there are no planes here in Columbia to get time on, to [get] one from out of town would cost more than I could afford…"[136] Zergler detailed that her status of physics major at a nearby university hampered her financial abilities, but assured that after finishing college she planned to go "out for flying in a big way."[137] While

[135] Clara Kutschinski, Survey, IWASM
[136] Leah Zergler, Survey, IWASM
[137] *Ibid.*

pilots like Kutschinski and Zergler fought to maintain their licenses, others such as Mary Ault did not fair so well. In her survey response, Ault, a single woman under 30 who worked as a secretary for her county attorney, indicated that her license had recently expired due to financial difficulties.

Even relatively well-established pilots within the aviation industry faced similar financial challenges, as pilot Melba Gorby revealed in her survey response. A charter member of the "99's," Gorby possessed an impressive record in aviation—as a pilot and also from a business angle. Gorby explained that she managed an entire "airplane business," assuming charge of "the mechanical work… [the] cleaning, adjusting, [as well as]….the financial" work.[138] What would seem a comparatively stable professional life, Gorby revealed, in reality, there was "very little money" in airport management. Citing a statistic confirmed by the Ninety-Nines survey data, Gorby explained: "With a goodly supply of women pilots in California, a woman pilot is almost as ordinary as a man, and being of the 'inferior sex', thus receives less than a man, instead of more wages."[139] A resident of California, Gorby faced the particular challenge of competing with an exceptional number of women pilots. As a result, this concentration mediated the occasional increase in women pilots' wages due to their uniqueness. Despite commanding a wealth of piloting, mechanical, and business management skills, Gorby confronted an all too familiar phenomenon: the wage gap between men and women—a professional and financial reality that served to severely handicap women's opportunities and resources, especially within the field of aviation.

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[138] Melba Gorby, Survey, IWASM
[139] *Ibid.*

Facing such financial barriers forced women to forge unconventional paths to obtain their licenses— these alternative routes made better use of their comparatively limited resources. When women were unable to "manage and save" their salary in order to afford flight instructions, as pilot Lucretia Hubbard reports doing, women chose to barter whatever un-paid labor skills they possessed.[140] Confessing a lack of aeronautical expertise, which excluded her from employment in the aviation industry, Emma Krienke represents women's occasional use of a more informal bartering system in obtaining flying credentials. A 23-year-old pilot from Wisconsin, Krienke reported that in lieu of her limited technical skills, she was nonetheless "a good cook, housekeeper, and [has] taken care of children." Krienke offers to put these often un-paid services to use by working "in a home at a small salary in return for flying time…"[141] While benefiting from a slightly less equitable trade, Corinne Conde also indicated that she had maintained her license in a rather non-traditional way. Conde explained that she found herself in a financial bind the year after earning her pilots license: "The next year I had practically no money, but through the generosity of the boys at the field was able to get in my required ten hours—no more, no less."[142]

Conde's success in uniquely funding her license touches on a common theme present in the stories of how most women managed their flying careers. Women commonly turned to those who more typically had access to the resources they needed—the men in their lives. Of the women surveyed, a somewhat surprising majority (58%) reported to be single. Yet, of the remaining women who were married, a clear majority

[140] Lucretia Hubbard, Survey, IWASM
[141] Emma Krienke Survey, IWASM
[142] Corinne Conde, Survey, IWASM

reported that their husbands worked in the aviation industry. Perhaps even more intriguing, a common experience shared by a number of women surveyed was a tendency to forge a romantic relationship with their flight instructors. Suzanne Williams, who learned to fly in Texas, reported that after obtaining her license she married her instructor and since has "done much flying about the country-singly and together." She also included, "We've two sport monoplanes and one is all mine…"[143] In addition, despite having "only a 9th grade education," Evelyn Burleson learned to fly in Nebraska and reported that she too married her instructor. Burleson indicated that since her marriage she would soon be "trying for a transport license," an additional flying credential beyond a private license, which would allow her to carry paying passengers. While it would certainly be shaky historical analysis at best to infer the intimate circumstances around which a number of women, like Williams and Burleson, chose to marry their flight instructors, this common occurrence nonetheless emerges from survey responses as a curious pattern. Despite their motivations in marrying their instructors, however, it is clear from their descriptions that these relationships positively influenced the direction of their careers—sometimes offering plane ownerships and new licenses.

In forging alternative paths to success within the aviation industry, women pilots of the Ninety-Nines Organization grouped together to renegotiate traditional expectations of their gender as well as commonly held ideas about technological use. Understood within this context, the innovation present at the first organizational meeting on December 7, 1929—when a mechanic's bench was transformed into a teacart—emerges as a guiding principle of the organization. Women pilots not only altered the physical

[143] Suzanne Williams, Survey, IWASM

tools of their trade, but also redefined the ideological underpinnings of their experience within the industry: by first, refuting the view of women as antithetical to technology, and second, countering the notion of flight as accessible to only a select few. The Ninety-Nines self-consciously organized itself around these central principles by keeping in close touch with the needs of the average woman pilot. As a result, the group responded to the needs expressed by its members through creating organizational discussions about work women performed within the aviation industry as well as by publicizing available positions within the field. In addition to providing a career network, the Ninety-Nines also successfully created social networks among women, publicized their accomplishments, and obtained important information about women pilots—making it a vital organization in the lives of women pilots in the 1920s and 30s.

EPILOGUE

INFINITE POSSIBILITES: IMAGINING AN EQUITABLE RELATIONSHIP BETWEEN GENDER AND TECHNOLOGY

Reporting on "The Ninety-Nines and the Future of Women in Aviation," record-breaking pilot Louise Thaden addressed an eager crowd at the National Aviation Forum. During her lengthy piloting career, Thaden worked in nearly every facet of the aviation industry—from mechanics and sales to test piloting. A seasoned veteran, she was especially equipped to remark on what the future of aviation would hold for women—as she knew first hand the rocky road that lay behind many average women trying to establish themselves professionally within the field. Despite such challenges, Thaden confidently declared: "[Women's possibilities in aviation] are infinite. To me," Thaden predicted, "it seems reasonable to expect that as aviation grows, so will women's opportunities to have a place and increasingly a part in it. Women's importance and worth to aviation will increase in direct ratio to their increased capabilities due to proper training along their particular field of endeavor, plus experience."[144]

While the aviation industry boomed in the years following Thaden's address, despite her prediction, women's place in aviation did not grow accordingly. The 1960s Candid Camera episode, in which customers laughed at the potential of a female airline pilot, clearly illustrates the persisting limitations women have faced throughout history.

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[144] [144] Louise Thaden, "The Ninety-Nines and the Future of Women in Aviaton" National Aviation Forum, May 27 (c. 1937-1939) NASM Bx.4 F. 3. On dating of the document, see Ch. 2, note 12.

What accounts for the stark contrast between the hopefulness of Thaden's 1930s prediction and the comedic value of women aviators in the 1960s hidden camera skit? As my thesis has proposed, gender and technology interacted in complex ways to shape the sociotechnological development of aviation. An analysis of the nature of this relationship serves as a starting point for understanding how perceptions of women and technology have changed throughout history.

In chapter one, I examined in particular the co-constitutive relationship between gender and technology. The fluidity of this interaction was restricted, however, as it depended on the relative malleability of aviation as an unfixed technological system.[145] As I explained, during the 1920s and 1930s—early in aviation's development—women carved out positions of technological authority for themselves as popularizers of flight. As the aviation industry began to solidify its position as a viable means of transportation—with the number of commercial airline passengers climbing from 173,000 in 1929[146] to a staggering 1,102,000 by 1937[147]—women were no longer needed to convince potential consumers of the safety of flight. As a result, Thaden's hopeful view of women pilots' future failed to materialize and women's public prominence in aviation in the years following the rise of commercial aviation largely declined.

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[145] See works on actor network theory and co-construction theories, especially works by Bruno Latour and Michel Callon.

[146] Rich Freeman, "The Pioneering Years: Commercial Aviation 1920-1930" *US Centennial of Flight Commission* http://www.centennialofflight.gov/essay/Commercial_Aviation/passenger_xperience/Tran2.htm (accessed April 19, 2007).

[147] Judy Rumerman, "Commercial Flight in the 1930s"*US Centennial of Flight Commission,* http://www.centennialofflight.gov/essay/Commercial_Aviation/1920s/Tran1.htm, (accessed April 19, 2007).

To say that women's involvement in aviation ended after this period, however, would be a grave misrepresentation. In fact, those women who continued to fly or became involved in the beginnings of the space industry in America faced similar cultural apprehensions surrounding gender and technology. Deborah Douglas's work *Women and Flight since 1940* provides the most comprehensive analysis of the changing roles of women in flight as well as the broader theoretical implications such a study has on our understandings of gender and technology.[148] Douglas describes the creation and then disbandment of several civilian flying groups with military affiliations during WWII. Along with crowds of women ushered out of the home and into the factory during the war, members of the Women's Airforce Service Pilots (WASPS) and the Women's Auxiliary Ferry Squadron (WAFS) were returned home at war's end to fulfill their primary domestic duties. Moving from the 1940s into the early 1960s, authors Margaret Weitekamp and Martha Ackman describe the experiences faced by women during the beginnings of the American space program.[149] In *Right Stuff, Wrong Sex*, Weitekamp explores the history of the first American training program for women astronauts. As with the development of aviation, during the early years of the space race, various actors made efforts to involve women. In 1958, medical experts began a program to test and train women for space flight. Facing ridicule from fellow astronauts and government personnel, the women's training program eventually crumbled under pressures of sexist assumptions without realizing its ultimate goal of putting women into space. Testifying in front of the 1962 House Subcommittee Hearings called to discuss the potential of

[148] Deborah Douglas, *Women and Flight since 1940*, The University Press of Kentucky, 2004.
[149] Martha Ackman, *The Mercury 13*, Random House Inc., 2003.

female astronauts, John Glenn highlighted the view of many members of the space program. Glenn stated, "The men go off and fight the wars and fly the airplanes and come back and help design and build and test them. The fact that women are not in this field is a fact of our social order. It may be undesirable."[150] Not only does Glenn ignore the long history of women's actual involvement in the field of aeronautics—which Weitekamp correctly points out—he also bases his estimation of women's incapability of space flight on socially constructed ideas of women as antithetical to technology. While female astronaut trainees as well as women pilots gained access into nascent technological fields, as both aviation and space flight developed into modern industries they were increasingly marginalized. Taking the role of gender seriously in shaping technologies, the model for sociotechnological change explored in my study of female pilots provides a useful framework to understand the continuing challenges women face as popular understandings fashion various technologies as masculine—especially those that become heavily militarized such as aviation and space flight.

In serving as technological mediators, however, women faced certain restrictions. Chapter two takes a closer look at the implications of women occupying roles of technological authority. Women who challenged traditional assumptions of femininity and gender roles often faced harsh criticism. This section also examines the roles of women as consumers of flight in shaping aviation's development. In doing so, this thesis also re-emphasizes calls with Science and Technology Studies to further investigate the roles of consumers in technological design and production. While studies of consumers of technology have thus far focused primarily on understanding the development and use

[150] Margaret Weitekamp, *Right Stuff, Wrong Sex*, Baltimore: Johns Hopkins University Press, 2004, 151.

of technologies specifically marketed toward women—i.e. household appliances—my thesis suggests there are similar stories to be discovered in which women as consumers played crucial roles in the development and assimilation of more mainstream technologies.

Finally, chapter three explores the rich histories of the individual women who flew during the period. In extending the narrative of women and aviation beyond Amelia Earhart, my work closely examines the technological society women formed, which was devoted to discussing matters of aviation. In this chapter I also took a closer look at the personal details of women who flew—revealing their varying socioeconomic backgrounds as well as their differing connections to aviation. Beyond filling in gaps in the historical record concerning the number of women who flew and their personal backgrounds, my research of female pilots during the period also uncovered interesting theoretical questions for further research. For instance, what can the lives of the female aviators included in this work tell us about the intersection of class and notions of femininity during the 1920s and 1930s? Were these women products of the dominant trend of liberal feminism of the time, or were they offering a new perspective on the construction of womanhood and gender equality—one in which technology played a central role?

While studies of gender and technology seem to only remain lessons in history, I believe that works such as this thesis can provide key starting points in both changing the present and imagining a different future. Understanding the gendered nature of sociotechnological change not only reveals the process through which aviation became

popular, but also offers a crucial insight into the ever changing relationship between gender and technology.

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